INTEGRATED DRIVER ELECTRONICS FOR MEMS DEVICE USING HIGH VOLTAGE THIN FILM TRANSISTORS

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ABSTRACT

An apparatus integrating electrostatically actuated MEMS devices and high voltage driver (actuator) electronics on a single substrate, where the driver electronics utilize offset-gate high voltage thin-film transistors (HVTFTs) that facilitate the transmission of high actuating voltages using relatively low control voltages, thereby facilitating the formation of large arrays of electrostatically-actuated MEMS devices. The driver circuit is arranged such that the high actuating voltage is applied to an actuating electrode of the actuated MEMS device and drain electrode of the HVTFT when the HVTFT is turned off, thereby minimizing dielectric breakdown. When the HVTFT is turned on in response to the relatively low control voltage, the high actuating voltage is discharged to ground from the drain (offset) electrode to the source (not offset) electrode.